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SOME PROBLEMS OF EFFECTIVENESS OF INVESTMENTS IN INDUSTRY

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No. 1201 Some Problems of Effectiveness Investments in Industry
D.

By

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1. Industrialisation as a necessary condition for the speedy development of productive forces in economically underdeveloped countries

(1) Industrialisation may be characterised as the process in the development of productive forces of a country during which, because of the increase in the production of the means of production a speedy extension of the material and technical base of all other branches of national economy takes place.

(2) As industrialisation is expressed foremost in the intensive construction of industrial plants where part of social labour is turned into industrially productive plants and equipment / = fixed capital /, society is not indifferent as to how much social labour it expends on these productive investments, for the results of the realisation of this labour is not directly the production of use values serving the satisfaction of the needs of the population / which is the lasting aim of social effort for instance in socialist countries and in economically underdeveloped countries this is an urgent contemporary task; / investments in production are, however, a necessary condition to attain this aim.

(3) The speed of industrialisation measured by the absolute increase in the physical volume of industrially productive plants per unit of time is limited by the maximum amount of means society is capable of expending on these purposes during this time unit. Determining the extent of these means is one part of the problem concerning investment construction, especially in the period of industrialisation.

(4) During industrialisation considerable changes take place at the same time in the development of the structure of the economy of the country, especially changes in the structure of sectors in the sphere of production. The development of the structure of sectors in the sphere of production of economy and thus also the development of the structure of sectors in the industrial production of the country depends on the one hand on the

development of social needs, and on the other hand on the developmer of objective conditions under which production takes place, mainly on the development of natural conditions which considerably influence the territorial division of labour within a country and among countries and are one of the main causes for the difference in the structure of production and the structure of the needs of society. The structure of sectors greatly influences the economic aspects of construction.

(5) It is for instance well known that the construction of heavy industry / e.g. metallurgy, heavy engineering, chemistry of coke, petro-chemistry, etc./ on the one hand makes great demands on investments; that the period of construction is considerable; that these sectors need a large power supply so that it is necessary during their construction to expend a considerable volume of investments on coal mining and the production of oil, the building of power stations, etc. On the other hand, however, where costs for the utilisation of the raw material and power resources for these branches are rather low due to favourable natural conditions, the construction of these sectors guarantees the speedy development of the productive forces and an increase in the standard of living of the population in the respective country in the future.

(6) The construction of light, mainly processing industry / e.g. food, textile, clothing, leather, ceramics, wood-working industry, etc./ demands less investments, the period of construction is comparatively short, far less power is needed and the industries in question produce products directly for the satisfaction of the needs of the population. It is usually not too difficult to obtain raw materials for these kinds of products. These branches are mainly based on agricultural and lumber production. The turnover of capital invested into these branches is quicker. On the other hand it is equally well known that both construction itself as well as the further development of the material and technical base of these and other branches depend on the existence of heavy industry, especially heavy engineering, the chemical industry, the industrial production of building materials, etc.

(7) The determination of the optimum structure of sectors for investments especially during the period of industrialisation is the other part of the problem of investment construction under discussion here.

(8) Even though the correct solution of the problem of industrialisation in countries that are at the present time considered as economically underdeveloped is not simple, there is no doubt that industrialisation is an objectively necessary process in the development of the economy of areas and countries having natural resources and man power, which may be attained purposefully and speeded up on the basis of a knowledge of the structure of the social needs, the objective conditions and concrete possibilities while at the same time eliminating obstacles arising out of the character of productive

relations.

(9) An important part is plaid throughout by the economic effectivity of investments.

2. Some problems of effectivity of investments in the period of industrialisation.

(10) Opinions for the ascertaining and measuring of economic effectivity vary. Very often means for investments are expressed as a ratio of the increase of the national income, at other times as that of the increase in production, or the influence of investments on the increase in the productivity of social labour is calculated, etc. Every one of these methods of measuring the effectivity of investments has its justification and both the advantages as well as the disadvantages are not entirely unknown. One of the problems of effectivity of investments as indicated above is the determination of the volume of investment in the course of a certain / e.g. unit / period. In attempting a general formulation of the problem the following basic considerations may be used as a starting point.

(11) If the lasting aim of society is to achieve a continuous increase in the standard of living of the population, this aim can only be attained on the basis of the continuous increase of that part of the national income allocated for consumption.

(12) Between the amount allocated for a consumption and the increase in investments over a certain period there exists a certain quantitative relationship. The increase in the amount allocated for consumption over a certain period equals the increase in the gross national income minus the increase in investments:

$$S = N_d + A_m - I, \qquad /1/$$

where S = the amount allocated for consumption per unit of time,

N_d = the net national income per unit of time / together with A_m it forms the so-called gross national income / ,

A_m = depreciation per unit of time,

I = investments per unit of time.

(13) In any period of time the increase in the amount alloted for consumption must be greater than zero. That means that during any period of time the volume of investments must be smaller than the gross national income:

$$I < N_d + A_m \qquad /2/$$

This inequality is identical with the following inequality:

$$I < P - M \qquad /3/$$

where P = the value of the social product created during the period,

M = value of the materials and raw materials used.

The proportions between I, P and M are illustrated in the following table:

Table 1

Indicator	NN	Symbol	Period 1 e.g.1955	Period 2 e.g.1957	Increase	Index
	0	1	2	3	4	5
value of social product	1=2+3+4+5	P	50	60	+ 10	120
value of materials and raw materials used	2	M	20	25	+ 5	125
depreciation	3	A_m	5	6	+ 1	120
wages	4	Z	15	16	+ 1	107
value of product for society	5	N	10	13	+ 3	130
national income	6=7+9(=1-2-3)	N_d	25	29	+ 4	116
accumulation	7	A_k	5	7	+ 2	140
investments	8=6+3-9	I	10	13	+ 3	130
consumption	9	S	20	22	+ 2	110
number of population in %	10	L	100	103	-	-
index of amount of consumption per head of population	11		-	106,7	-	-

(14) It will be seen from this table that both in the separate years / 1955, 1957 / as in the increases for the two-year period relationship /3/ is fulfilled:

Year 1955: 10 50 - 20

Year 1957: 13 60 - 25

Increase: 3 60 - 50 - (25 - 20)

(15) It is necessary but insufficient condition for the correct application of investment policy to keep the last of the above-mentioned quantitative relationships. The other and decisive condition is the necessity of the increase in the amount allotted for consumption per head of population so that the increase in this amount must be greater than the speed of increase in the number of population as expressed by the following inequality:

$$\frac{dS}{S \cdot dt} \qquad \frac{dL}{L \cdot dt} \qquad /4/$$

where $\frac{dS}{S \cdot dt}$ = the infinitisimal expression of the relative increase in the amount allocated for consumption per unit of time / $S = f_1(t)$;

$\frac{dL}{L \cdot dt}$ = dtto number of population / $L = f_2(t)$; L = number of population in time t

(16) If the average consumption per unit of time and head of population at a certain moment is given as $\underline{s}$ then it is valid that:

$$s = \frac{S}{L} \; ; \; / s = f_3 (t) / \qquad / 5 /$$

then the highest economic effectivity of investments at any moment in the development of the national economy is achieved when the following relationship is continuously fulfilled:

$$\frac{ds}{dt} = \max! \qquad / 6 /$$

which lays down the condition that the average consumption per head of population and unit of time should continuously increase as much as possible.

(17) The demand can be fulfilled under condition that the amount allocated for consumption per unit of time / S / is at its maximum. As the amount allocated for consumption is the function of the volume of investments / $S = A_m + N_d - I$ /,

$$E = \frac{S}{I} = \frac{A_m + N_d}{I} = 1 = \max! \qquad / 7 /$$

where E = the index of effectivity of investments.

Thus: $$\frac{P - M}{I} = \max! \qquad / 8 /$$

(18) The total volume of means expended in the course of a certain period on productive investments has from the point of view of reproduction itself of basic productive plants and equipment / or fixed capital / its own structure and is divided into four parts / A, B, C, D /.

(19) The first part / A / are means expended on general repairs of those productive plants which are running in the given period of time. These means are a "necessary evil" for they do not cause any considerable change in the form of the repaired plants but only eliminate the results of their physical wear. The volume of these means depends on the physical volume of the productive plants, their age and the intensity of physical wear.

(20) The second / B / are means expended on the renewal of plants scrapped during this period. The volume of these means depends on the physical volume of plants in existance and their average service life.

(21) The third part / C / includes means spent on the establishments of plants by which the whole group of production plants during the given time is increased. This volume of means is the characteristic for the rate of growth of reproduction and one of the basic presuppositions for the increase of the total production during the given period.

(22) The fourts part / D / represents means spent on the construction of plants which during the given period are not yet put into production. These means are the presupposi-

tion for the further increase in production in the future. Their volume depends on the average time of construction and how the volume of production is planned for the next period.

(23) From the point of view of increase in production caused by investments the above-mentioned volumes of means may be classified as follows:

(a) volume of means / C / leads to the greatest increase in production

(b) volume / B /, / renewal / causes increase in production only as a result of technical progress

(c) volume / A /, / general repairs / causes either a very slight or no increase in production

(d) volume / D / under no account leads to any increase in production during the given period of time

(24) The period after the beginning of the speedy construction of industrial plants with a high speed of industrialisation may be divided into three stages:

(i) in the first stage the greatest share of the total volume of investments is represented by unfinished investments / D / that have no effect on production at all. This stage is the most difficult from the point of view of fulfilling the demand of the maximum increase in the amount allocated for consumption per head of population where exclusively the country's own resources are used to make these investments. The length of this stage equals the length of construction of industrial plants which depends on the branch structure of investments

(ii) The second stage is characterised by the greatest speed in the increase in production as quite new plants are put into production that do not need any considerable repairs. Thus effectivity of investments begins to show in its full extent as part / C / increases relatively most quickly

(iii) In the course of the third stage the part of means expended on general repairs starts increasing, which relatively decreases the effectivity of the total investments.

(25) Towards the end of the third stage part / B / begins to increase / renewal / thus relatively increasing the effectivity of investments / as a result of technical progress / and then during further extension of the physical volume of plants the structure from the point of view of the relative ratio of parts A : B : C : D changes relatively little and becomes almost stabilised. The total length of these three stages depends on the time of turnover of fixed capital increased by the time of construction.

(26) The effectivity of investments may therefore be symbolically expressed by the following relationship:

$$E = \frac{P - M}{A + B + C + D} \qquad /9/$$

(27) The volume of production / P / depends on the total physical volume of fixed capital / F / on its effectivity / U / and the coefficient of the duration of its use / k_t / :

$$P = F \cdot U \cdot k_t \qquad / 10 /$$

(28) The value of raw materials and materials used depends on the volume of production / P / and the coefficient of requirements of material / k_M / so that the effectivity of investments may be expressed as folows:

$$E = \frac{F \cdot U \cdot k_t \ (1 - k_M)}{A + B + C + D} \qquad / 11 /$$

(29) At the beginning of industrialisation / during the three stages / the volume of means / B / is small and the volume of means / A / - respectively the sum of A + B is determined more or less objectively / and can be minimised on the basis of determining the optimum average service life /. The effectivity of the physical volume of fixed capital / U / and the coefficient of requirements of materials / k_M / depend on the structure of sectors of fixed capital / F / which is the result of construction in the past. This is why the determination of total volumes / C / and / D / is decisive during every stage and the arrangement of the structure of its sectors in such a way that both during the given stage as well as in the future the demand expressed by relationship no. 6 should be fulfilled:

$$\frac{ds}{dt} = \max!$$

(30) This can be achieved over a long period of development only by a suitable combination of the construction of industries producing both consumer goods as well as means of production.

3. Some experiences in industrialisation from Czechoslovakia.

(31) In the Czechoslovak Socialist Republic, which set out on the road of socialist construction after the Second World War, the intensive industrialisation of economy is one of the most typical features. At the beginning of socialist construction Czechoslovakia was a country with a relatively highly developed industry. The share of industry in the creation of the national income in 1948 amounted to 67 % . The greatest share in the total volume of industrial production was taken up by the food industry which was mainly based on the home agricultural production. At the same time a very large part was played in the total industrial production by the engineering and metal industry.

(32) One of the basic tasks of socialist construction in Czechoslovakia was to raise the standard of living of the population of Slovakia to that of the population of the

Czech lands, as Slovakia as a result of previous development was a backward agricultural region. The fulfilling of the program of the speedy industrialisation of Slovakia was based on the further development foremost of heavy industry in the Czech lands, mainly engineering industry, metallurgy, mining, chemistry and power production.

(33) One of the most important tasks was the equipment of agriculture in Czechoslovakia with modern machines during its socialisation which means a change-over from small-scale production to socialist large-scale production with a simultaneous absolute decrease of man power in agriculture and their switch-over to industry.

(34) Similarly it was necessary in the food and consumer goods industry to change over from small-scale production by craftsmen to industrial large-scale production, ensuring a considerable increase in the productivity of labour.

(35) This speedy construction and reconstruction of the economic structure of Czechoslovakia was conditioned by intensive investments, mainly in industry. From total investments made during the period 1951 - 1960 in national economy which amounted to 270 milliard Kčs 109 milliard Kčs was put into industry, i.e. 40%. The value of basic funds put into production in the state industrial enterprises during this period amounted to 98 milliard Kčs, the overwhelming part of these means being increases in production capacity. At the present time the share of investments for renewals in the total share of investments is beginning to increase.

(36) As a result of industrialisation total industrial production in Czechoslovakia in the period from 1948 to 1960 increased 3,72 times, in Slovakia 5,23 times; production of power increased 3,6 times, in Slovakia 6,6 times; metallurgy 3,75 times, in Slovakia 4,13 times; engineering 6,63 times, in Slovakia 10,11 times; chemical industry 6,04 times, in Slovakia 8,34 times; food industry 2,64 times, in Slovakia 3,87 times.

(37) The share of industry in the total creation of national income increased from 67% to 70%.

(38) The national income of the Czechoslovak Socialist Republic increased 2,51 times and the personal consumption 2,01 times.

(39) From the point of view of production and consumption of the most important products Czechoslovakia takes its place among the most developed countries in the world.

(40) By developing industrial production and productive forces in Czechoslovakia during the above mentioned period the mobilisation of the internal resources of the country was achieved as well as of the intensive creative activity of the working people. At the same time cooperation with the countries of the world socialist camp was increased and intensified.

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